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Docket No.: 500.43092X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Yasuyuki MIMATSU et al.

Serial No. 10/650,858

Filed: August 29, 2003

For: DATA BACKUP METHOD AND SYSTEM

SUPPLEMENTAL REQUEST FOR RECONSIDERATION UNDER 37 CFR §1.102(MPEP §708.02)

June 17, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Supplemental to the Request for Reconsideration filed on April 19, 2005, in view of the meeting between Mr. Brundidge and Mr. Laufer held on June 9, 2005 clarifying issues related to the granting of Petitions to Make Special, Applicants submit the following additional remarks.

It is submitted that the cited references, whether considered alone or in combination, fail to disclose or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to disclose or suggest in combination with the other limitations recited in the claims:

a first feature of the present invention as recited in independent claim 1 including storing, by said disk array, at least said information about said second storage region and said information about backup of said first storage region sent

as above into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data;

a second feature of the present invention as recited in independent claim 9 including backing up said data of said first storage region into said second storage region in response to said command, and storing at least said information about said second storage region and said information about said backup of said first storage region as management information for said backup data in a storage region different from said second storage region within said disk array so that said management information can be recorded in association with said backup data;

a third feature of the present invention as recited in independent claim 10 including for making said first storage region and said second storage region be associated with each other on the basis of a command from said computer; and means for storing information about said first storage region and information received from said computer in said second storage means; and

a fourth feature of the present invention as recited in independent claim 12 wherein means for storing at least said information about said second storage region and said information about the backup of said first storage region sent as management information for said backup data from said computer in a storage region different from said second storage region within said disk array on the basis of at least said information about said second storage region and said

information about said backup of said first storage region so that said management information can be stored in association with said backup data.

To the extent applicable to the present Petition, Applicants submit that although the distinguishing feature(s) may represent a substantial portion of the claimed invention, the claimed invention including said feature(s) and their inter-operation provides a novel storage system and system and method related to or implemented in or by said storage system not taught or suggested by any of the references of record.

The references considered most closely related to the claimed invention are briefly discussed below:

U.S. Patent No. 6,205,450 (Kanome) discloses a disk snapshot section inserted between a file system and a disk unit appropriately takes a snapshot that holds the contents of files stored in the disk unit at a predetermined timing, and stores the snapshot in the disk unit. The disk snapshot section sets a virtual disk drive which stores files having the contents held by the designated snapshot upon restarting the system, and makes the file system recognize the virtual disk drive. The system can be easily restarted using a disk image of an arbitrary snapshot. Kanome, at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated

with said backup data. More particularly, Kanome does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent No. 6,691,245 (DeKoning) discloses a mirrored data storage system utilizes a first host device and a local storage device for primary data storage and a second host device and a remote storage device for mirrored, fail-over storage on behalf of client devices. At periodic intervals (called checkpoints), the first host device initiates data synchronization between itself and the two storage devices and issues checkpoint information to ensure that each device maintains information for a common stable storage state. The local storage device synchronizes its stored data and forwards the checkpoint information to the remote storage device. The remote storage device maintains a copy (called a snapshot) of the data at the common stable storage state. Given the snapshot and the checkpoint information, the remote storage device can restore itself to the common stable storage state in the event of a failure of the first host device and/or the local storage device. Upon failure of the first host device and/or the local storage device, the second host device is instructed to initiate a switch, or fail-over, to serving as the primary data storage on behalf of the client devices. DeKoning, at a minimum, fails to disclose or suggest storing,

by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data. More particularly, DeKoning does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent No. 6,694,413 (Mimatsu et al.) discloses a method of managing snapshot data of a computer system provided with a computer and a storage subsystem coupled to the computer, and the computer system to which the method is applied, are disclosed. The storage subsystem is provided with the duplicated first and second storage units. In the state in which they are duplicated, when a request to update data is issued to the first storage unit, the storage subsystem writes the same updated data onto the second storage unit. When an acquisition of the snapshot is requested by the computer at any time, the storage subsystem suspends the writing of the writing data for the first storage unit onto the second storage unit thereafter. When making the contents of the first storage unit and the second storage unit the same, the data written

onto the first storage unit after the acquisition of the snapshot is requested is written onto the second storage unit. Mimatsu et al., at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data. More particularly, Mimatsu et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2003/0131278 A1 (Fujibayashi) discloses a method for remote backup includes: mirroring data from a primary storage device at a first location to a secondary storage device at a second location; taking a snapshot of the primary storage device and of the secondary storage device; storing the primary storage device and of the secondary storage device; storing the primary storage device snapshot on a first snapshot volume at the first location; storing the secondary storage device snapshot on a second snapshot volume at the second location; updating a data structure to record backup times for the first and second snapshots and to record locations of the snapshots on

the snapshot volumes; and repeating the above so as to store multiple generations of snapshots. A method for fast restore uses a selected snapshot located at the first location to restore data. If the selected snapshot at the first location is not available, the selected snapshot at the second location is used. Fujibayashi, at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data. More particularly, Fujibayashi does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0093474 (Lin et al.) discloses a method for efficiently maintaining snapshot instances. To maintain the state of snapshot instances, the snapshot copies the data needed to be protected into free space on the same volume. In order to identify whether a block is free, a snapshot record is created for each block on a volume to record write operations on the block. With these snapshot records, the allocation status of blocks on a volume can quickly be identified. Free space allocation is then accomplished by

allocating free space via the file-system provided interface and identifying it with snapshot records. With this mechanism, snapshot software can allocate free space to store snapshot metadata and "copy-to-write" data dynamically. Lin et al., at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data. More particularly, Lin et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0168034 A1 (Homma et al.) discloses a storage apparatus controls primary and secondary volumes as a pair, using a logical snapshot management table that indicates in which volume data to be accessed is retained to thereby enable an immediate access to a logical frozen image. Homma et al., at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said

information can be stored as management information for said backup data, and to be associated with said backup data. More particularly, Homma et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0186900 (Nakano et al.) discloses snapshots are implemented by combining original data in a place where an operational volume has been updated with data in a place where the operational volume has not been updated. A snapshot management table maintains a value indicating that update has not been conducted, or a storage place of original data, for each combination of blocks in the operational volume and the snapshots. If there is a snapshot in which update has not been conducted in a update place at the time of update, then original data is copied and the snapshot management table is updated. The copied original data is managed by a difference block management table, which has a value indicating whether respective snapshots are referencing the data. If a snapshot is deleted, then the value indicating that the snapshot is referencing is altered in all entries in the difference block management table. Nakano et al., at a minimum, fails to disclose or suggest storing, by a disk array, at least said information about a

second storage region and an information about backup of a first storage region into a storage region different from said second storage region within said disk array so that both said information can be stored as management information for said backup data, and to be associated with said backup data, and/or means for storing at least said information about said second storage region and said information about the backup of said first storage region on the basis of at least said information about said second storage region and said information about said backup of said first storage region so that said management information can be stored in association with said backup data. More particularly, Nakano et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims.

Therefore, since the cited references fail to disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 9, the above described third feature of the present invention as recited in independent claim 10 and the above described fourth feature of the present invention as recited in independent claim 12, in combination with the other limitations recited in each of the independent claims, it is submitted that all

of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Respectfully submitted,

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